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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,109	02/03/2004	Jeremie Dalton	NOVLP082/002893	4875

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BEYER WEAVER & THOMAS LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER	
STARK, JARRETT J	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/772,109	DALTON ET AL.	
	Examiner	Art Unit	
	Jarrett J. Stark	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/4/06 have been fully considered but they are not persuasive.

The Applicants must be confused regarding US patent application prosecution as it pertains to provisional applications and effective filing dates. The Applicants contends should the Examiner still maintain his objections and use the contents of the provisional applications against Claims 1-23 of the present application, that the examiner should cite specific sections of the provisional application. The Examiner would like to make clear that he is **not** using the contents of the provisional application against Claims 1-23, but rather using the full disclosure of Lopatin found in US Pub 2005/0085031, which incorporates the provisional application, by reference. The MPEP clearly states that the effective filing date of an application that has a provisional application is the date of filing of that provisional application. Please read the following from the MPEP for clarification.

> V. DETERMINING THE EFFECTIVE FILING DATE OF THE APPLICATION
> The effective filing date of a U.S. application may be determined as follows:
>
> (A) If the application is a continuation or divisional of one or more earlier U.S. applications or international applications and if the requirements of 35 U.S.C. 120 and 365(c), respectively, have been satisfied, the effective filing date is the same as the earliest filing date in the line of continuation or divisional applications.
>
> (B) If the application is a continuation-in-part of an earlier U.S. application or international application, any claims in the new application not supported by the specification and claims of the parent application have an effective filing date equal to the filing date of the new application. Any claims which are fully supported under 35 U.S.C. 112 by the earlier parent application have the effective filing date of that earlier parent application.
>
> (C) If the application claims foreign priority under 35 U.S.C. 119(a)-(d) or

365(a)>or (b)<, the effective filing date is the filing date of the U.S. application, unless situation (A) or (B) as set forth above applies. The filing date of the foreign priority document is not the effective filing date, although the filing date of the foreign priority document may be used to overcome certain references. See MPEP § 706.02(b) and § 2136.05.

(D) **If the application properly claims benefit under 35 U.S.C. 119(e) to a provisional application, the effective filing date is the filing date of the provisional application for any claims which are fully supported under the first paragraph of 35 U.S.C. 112 by the provisional application.**

The effective filing date of Lopatin is established as **October 15, 2003**, which is nearly 4 months prior to the Applicants filing date of February 3, 2004. Pursuant to the established practice as set forth in the MPEP, the Applicant's argument regarding the effective filing date and the Examiners use as prior art of the Lopatin reference is **moot**.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-23 are rejected under 35 U.S.C. 102(a) as being anticipated by Lopatin et al. (US 2005/0085031).

Regarding claim 1, Lopatin discloses a method of protecting an exposed copper surface of a partially fabricated IC from oxidation during exposure to an oxygen-containing environment, the method comprising: contacting the exposed copper surface with a metallocene compound; and

contacting the exposed copper surface with the oxygen-containing environment, whereby exposure to the metallocene compound minimizes formation of copper oxide on the exposed copper surface. (Lapatin, [0009])

Regarding claim 2, Lopatin discloses the method of claim 1, wherein the metallocene contains a metal selected from the group consisting of ruthenium, cobalt, nickel, iron, palladium, platinum, titanium, chromium, osmium, manganese, and cobalt. (Lapatin, [0083])

Regarding claim 3, Lopatin discloses the method of claim 1, wherein the metallocene is ruthenocene. (Lapatin, [0083])

Regarding claim 4, Lopatin discloses the method of claim 1, wherein contacting the exposed copper surface with a metallocene compound comprises flowing a gas containing metallocene over the partially fabricated IC. (Lapatin, [0080])

Regarding claim 5, Lopatin discloses the method of claim 1, wherein contacting the exposed copper surface with the oxygen-containing environment comprises contacting the exposed copper surface with a compound that forms a solid phase layer on the partially fabricated IC. (Lapatin, [0009])

Regarding claim 6, Lopatin discloses the method of claim 5, wherein the compound is a precursor compound that reacts with an oxygen-containing species to form the solid phase layer. (Lapatin, [0009])

Regarding claim 7, Lopatin discloses the method of claim 1, wherein contacting the exposed copper surface with the oxygen-containing environment comprises contacting the exposed copper surface with a diffusion barrier precursor, which reacts with an oxygen-containing species to form a barrier layer on the partially fabricated IC. (Lapatin, [0012])

Regarding claim 8, Lopatin discloses the method of claim 7, wherein the oxygen-containing species is molecular oxygen. . (Lapatin, [0008])

Regarding claim 9, Lopatin discloses the method of claim 1, wherein contacting the exposed copper surface with the oxygen-containing environment comprises contacting the exposed copper surface with an etch stop precursor, which reacts with an oxygen-containing species to form an etch stop layer on the partially fabricated IC. (Lapatin, [0009])

Regarding claim 10, Lopatin discloses the method of claim 1, wherein contacting the exposed copper surface with the oxygen-containing environment comprises contacting the exposed copper with the ambient or other oxygen-containing environment during storage or transport between processing modules. (Lapatin, [0008])

Regarding claim 11, Lopatin discloses the method of claim 1, wherein the exposed copper surface comprises a copper seed layer on the partially fabricated IC. (Lapatin, [0016])

Regarding claim 12, Lopatin discloses a method of passivating and using an exposed copper surface of a partially fabricated IC, the method comprising:

contacting the exposed copper surface with a metallocene compound to thereby passivate the surface; and . (Lapatin, [0083])

depositing a layer of material on the partially fabricated IC using an oxygen-containing deposition chemistry. (Lapatin, [0009])

Regarding claim 13, Lopatin discloses the method of claim 12 further comprising performing the contacting and depositing step in a single chamber. (Lapatin, Claim 65)

Regarding claim 14, Lopatin discloses the method of claim 12 wherein the depositing is conducted using the metallocene compound as a chemical precursor to the material. (Lapatin, [0083])

Regarding claim 15, Lopatin discloses the method of claim 12 wherein the contacting and depositing operations are done concurrently. It is inherent that if a material is being deposited upon a layer it will be contacting the layer it is being deposited upon.

Regarding claim 16, Lopatin discloses the method of claim 12, wherein the metallocene is contains a metal selected from the group consisting of ruthenium, cobalt, nickel, iron, palladium, platinum, titanium, chromium, osmium, manganese, and cobalt. (Lapatin, [0083])

Regarding claim 17, Lopatin discloses the method of claim 12, wherein the metallocene is ruthenocene. (Lapatin, [0080] – [0083])

Regarding claim 18, Lopatin discloses the method of claim 12, wherein contacting the exposed copper surface with a metallocene compound comprises flowing a gas containing metallocene over partially fabricated IC. (Lapatin, [0080])

Regarding claim 19, Lopatin discloses the method of claim 12, wherein the depositing of a layer of material comprises contacting the exposed copper surface with a compound that forms a solid phase layer on the partially fabricated IC. (Lapatin, [0009])

Regarding claim 20, Lopatin discloses the method of claim 12, wherein the depositing of a layer of material comprises contacting the exposed copper surface with a diffusion barrier precursor, which reacts with an oxygen-containing species to form a barrier layer on the partially fabricated IC. (Lapatin, [0009])

Regarding claim 21, Lopatin discloses the method of claim 20, wherein the oxygen-containing species is molecular oxygen. (Lapatin, [0008])

Regarding claim 22, Lopatin discloses the method of claim 12, wherein depositing a layer of material comprises

contacting the exposed copper surface with an etch stop precursor, which reacts with an oxygen-containing species to form an etch stop layer on the partially fabricated IC. (Lapatin, [0009])

Regarding claim 23, Lopatin discloses the method of claim 12, wherein the exposed copper surface comprises a copper seed layer on the partially fabricated IC. (Lapatin, [0016])

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jarrett J. Stark whose telephone number is (571) 272-6005. The examiner can normally be reached on Monday - Thursday 7:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JJS
April 19, 2006